epiTRENDS

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Study Findings Suggest Avoiding Albacore Tuna to Reduce Dietary Exposure to Mercury

Babies of women who eat fish with large amounts of mercury and young children who eat such fish are at increased risk of developmental problems that can affect their ability to learn. Recent data from the Washington Behavioral Risk Factor Surveillance System (BRFSS) indicate that canned tuna is consumed three times more frequently than other store-bought fish. Reports from survey respondents indicate that more than 20% of women aged 18 to 44 and 15% of children 1 to 4 years of age eat canned tuna once a week or more.

Concern about this potential danger to the health of infants and young children prompted the Department of Health to investigate the mercury levels in various types of canned tuna. Results showed that levels in canned "light" tuna are three times lower than in canned albacore tuna (also called "white" tuna).

"Fish is a healthy food, and eating a variety of fish is an important part of a good diet," said Dr. Maxine Hayes, state health officer. "What we have learned through this study can help us make wise choices on fish consumption. It tells us that eating light tuna and avoiding albacore tuna reduces our exposure to mercury, and that's important information."

Analyzing 289 Cans from 83 Stores

Previous studies on mercury levels in canned tuna were over 10 years old and were not designed specifically to assess differences among the various types. A few small studies had suggested important differences between albacore and light canned tuna. The latter, usually labeled "chunk light" or "solid light," can be a mix of several types of tuna. Cans of "white" tuna contain only albacore.

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Avian Influenza Is Not Just for the Birds

The World Health Organization (WHO) issued alerts in January and February about avian influenza outbreaks among poultry flocks in many parts of the world. Illness in Vietnamese chickens may seem a remote concern, but it is not. The impact on humans could be huge, with the worst-case scenario a worldwide influenza pandemic.

Influenza (flu) is highly contagious through respiratory secretions and is usually transmitted from person to person when an infected person coughs or sneezes. It is a winter respiratory infection, but is more serious that the common cold. Fever, sore throat, cough, headache, and severe fatigue may require one to two weeks for full recovery. Some strains can cause significant mortality.

Influenza A Across Species, Across the World

Both influenza types A and B infect humans, influenza A most commonly. Influenza A can also infect animals such as pigs and birds. Waterfowl are the primary reservoir of avian influenza, and transmission among this group is fecal-oral. Avian influenza viruses usually do not directly infect humans, but sporadic human infections and outbreaks have occurred since 1997 (sidebar, page 2).

Influenza type A viruses are divided into subtypes based on two surface proteins, hemagglutinin (H) and neuraminidase (N). Many H subtypes circulate among birds, but until recently only three H strains were known to affect humans — H1, H2, and H3.

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Avian influenza *(from page 1)*

An outbreak of highly pathogenic avian influenza H5N1 began in Southeast Asia in December 2003 and has spread to many Asian countries. Infected flocks have been found in South Korea, Vietnam, Thailand, Cambodia, Indonesia, China, Hong Kong, and Japan. As of early March, 33 human cases of avian influenza A have been confirmed in Thailand and Vietnam; 22 of these cases were fatal. This virus has developed resistance to some antiviral agents; the clinical significance is still unclear but is of concern.

Since the beginning of the year, outbreaks of avian influenza have occurred in other parts of the world, including North America, where poultry flocks in Texas, Delaware, and British Columbia have been infected. No human cases have been associated with the North American avian outbreaks.

Why So Much Concern About Flu in Birds?

First, it is important to understand the ways people gain protection against flu: (1) Over a lifetime of exposures, a person will develop some immunity to strains that commonly affect humans; (2) Each year, effective vaccines are developed based on the most commonly circulating human strains; these vaccines are recommended for people most at risk for severe illness due to flu; and (3) Antiviral agents can be given to treat or prevent flu infection.

All flu viruses have the potential to mutate, and those that infect birds can develop the ability to infect humans and spread from person to person. Because this happens so rarely, most people would lack immunity to a new flu virus. In addition, development of an effective vaccine for a novel strain can take months, and is complicated because the high pathogenicity of avian influenza strains interferes with vaccine production methods that rely on the use of eggs. The lack of widespread immunity combined with the lack of an effective vaccine increases the likelihood of a worldwide influenza epidemic, or pandemic.

Influenza pandemics of the past century were caused by novel influenza strains. Without existing immunity from prior infections and vaccine to protect the population, these new strains spread rapidly around the globe. An avian influenza A virus probably caused the 1918–1919 pandemic, the deadliest on record.

In the absence of effective treatment or vaccine, planning and preparation are the only defense against a new influenza pandemic. The current avian outbreaks are a reminder that strong foundations in public health, healthcare, and emergency response are necessary to deal with emerging infectious diseases.

For More Information

Additional information and recommendations are available on the CDC and WHO websites:

- www.cdc.gov/flu/avian/index.htm
- www.who.int/csr/disease/avian_ influenza/en/

Recent Outbreaks of Avian Influenza that Infected Humans

1997 — An outbreak of H5N1 affected chickens and humans in Hong Kong. Direct transmission from birds to humans occurred, and possibly person-to-person transmission. Of 18 persons hospitalized, six died.

1998–99 — H9N2 from poultry infected people in Hong Kong and the People's Republic of China.

2003 — H5N1 infected at least two members of a Hong Kong family who traveled in China, and one died. The source of the infection was never identified.

2003 — H7N7 infected poultry and more than 80 poultry workers and their family members in the Netherlands. A veterinarian who visited an affected farm died. No evidence of human-to-human transmission was found in this outbreak.

2003 — In Hong Kong, one case of H9N2 was confirmed in a child, who recovered from the illness.

Changes Ahead for *epi*TRENDS

Beginning in July, *epi*TRENDS will be available online only.

To obtain e-mail notification of *epi*TRENDS, please register at this website. Choose the option to join the listserv.

http://listserv.wa.gov/archives/epitrends.html

Enter your name and e-mail address, leaving the other default values.

If you have questions, please contact us at: function@u.washington.edu.

Monthly Surveillance Data by County

February 2004* – Washington State Department of Health

County	E. coli O157:H7	Salmonella	Shigella	Hepatitis A	Hepatitis B	Non-A, Non-B Hepatitis	Meningococcal Disease	Pertussis	Tuberculosis	Chlamydia	Gonorrhea	AIDS	Pesticides†	Lead§#
Adams	0	0	0	0	0	0	0	0	0	0	0	0	0	0/30
Asotin	0	0	0	0	0	0	0	0	0	2	0	0	0	0/0
Benton	0	3	0	0	0	0	0	0	1	32	2	0	0	0/17
Chelan	0	0	0	0	0	0	0	0	0	10	0	0	0	2/24
Clallam	0	0	0	0	0	0	0	0	0	14	2	0	0	0/#
Clark	1	1	1	1	0	0	0	0	0	66	21	1	0	0/10
Columbia	0	0	0	0	0	0	0	0	0	2	0	0	0	0/0
Cowlitz	0	0	0	0	0	0	0	0	0	23	2	1	1	0/14
Douglas	0	0	0	0	0	0	0	0	0	10	0	0	0	0/#
Ferry	0	0	0	0	0	0	0	0	0	1	0	0	0	0/0
Franklin	0	1	0	0	0	0	0	0	1	19	1	1	0	1/9
Garfield	0	0	0	0	0	0	0	0	0	0	0	0	0	0/0
Grant	0	0	0	1	0	0	0	0	6	13	0	0	0	3/62
Grays Harbor	0	0	0	0	0	0	0	0	0	9	0	0	0	1/#
Island	0	0	0	0	0	0	0	1	0	28	2	0	0	1/9
Jefferson	0	0	0	0	0	0	0	0	0	2	1	0	0	0/#
King	0	10	3	2	4	0	2	13	12	402	98	22	3	2/54
Kitsap	0	0	0	0	0	0	0	0	0	53	6	1	0	1/#
Kittitas	0	0	0	0	0	0	0	0	0	18	0	0	0	0/0
Klickitat	0	0	0	0	0	0	0	0	0	8	0	0	0	0/#
Lewis	0	0	0	0	0	0	0	0	1	0	0	0	0	0/#
Lincoln	0	0	0	0	0	0	0	0	0	0	0	0	0	0/0
Mason	0	1	0	0	0	0	0	0	0	13	1	1	0	0/0
Okanogan	0	0	0	0	0	0	0	0	0	10	0	0	0	0/19
Pacific	0	0	0	0	0	0	0	0	0	3	0	0	0	0/0
Pend Oreille	0	0	0	0	0	0	0	0	0	1	0	0	0	0/0
Pierce	0	1	0	0	0	0	0	5	2	207	34	2	0	0/25
San Juan	0	0	0	0	0	0	0	0	0	2	0	0	0	0/0
Skagit	0	1	0	1	0	0	0	0	0	30	2	0	0	0/0
Skamania	0	0	0	0	0	0	0	0	0	0	0	0	0	0/0
Snohomish	0	3	0	1	0	0	0	1	0	113	17	1	0	0/8
Spokane	0	0	0	0	0	0	0	0	1	72	8	4	0	0/25
Stevens	0	0	0	0	0	0	0	0	0	3	0	1	0	0/#
Thurston	0	0	0	0	0	0	0	1	1	28	3	1	0	0/5
Wahkiakum	0	0	0	0	0	0	0	0	0	0	0	0	0	0/0
Walla Walla	0	0	0	0	0	0	0	0	0	41	2	0	0	0/28
Whatcom	0	0	0	0	0	0	0	0	0	50	8	0	0	0/11
Whitman	0	0	0	0	0	0	0	0	0	20	1	0	0	0/#
Yakima	0	0	0	0	1	0	0	2	3	99	14	0	0	0/12
Unknown														0/0
Current Month	1	21	4	6	5	0	2	23	22	1403	225	36	4	10/382
February 2003	5	32	16	3	6	1	4	26	16	1113	208	38	5	6/411
2004 to date	2	22	7	8	9	0	2	25	37	2559	453	64	8	21/798
2003 to date	8	45	16	5	7	1	6	28	34	2426	455	86	10	20/895

* Data are provisional based on reports received as of February 29, unless otherwise noted.
† Unconfirmed reports of illness associated with pesticide exposure.
§# Number of elevated tests (data include unconfirmed reports) / total tests performed (not number of children tested); number of tests per county indicates county of health care provider, not county of residence for children tested; # means fewer than 5 tests performed, number omitted for confidentiality reasons.

Mercury in Tuna *(from page 1)*

To investigate these differences, staff from the Office of Environmental Health Assessments designed a study to collect and analyze a random sample of each type of canned tuna available for retail purchase across Washington. Type was defined as the combination of species (white/albacore vs. light), packing (solid vs. chunk), and medium (oil vs. water). A preliminary survey of canned tuna in retail stores did not find any stores that carried chunk albacore (white) tuna in oil; thus, the study tested seven types of tuna available to consumers. The study was not designed to assess differences among brands of tuna.

To obtain this random sample, stores were first randomly selected, with the probability of selection based on the total amount of food sales reported by that store. Stores that sold the most tuna were more likely to be included in the study. Staff visited each store and randomly selected one can of each type of tuna available at that store. The goal was to collect and analyze 40 cans of each type of tuna.

Staff collected 289 cans of tuna from 83 stores across the state. The Department of Ecology's Manchester Environmental Laboratory analyzed all the samples. Regression analysis was used to assess levels of mercury in the different types. The species of fish was the only factor of significance. Albacore (white) tuna had an average of 215 parts per billion of mercury, compared to an average of 57 ppb in canned light tuna. The analyses found no significant differences between solid and chunk tuna, or between tuna packed in water versus oil. The Food and Drug Administration and other states are collecting additional data that may lead DOH to revise its consumption recommendations based on the type of canned tuna, whether albacore or light tuna.

The Mercury Pathway

The species of tuna typically used for the "light" variety are smaller than albacore and usually feed lower on the food chain. Larger fish tend to be older and have had more time to accumulate mercury. Also, fish that are higher on the food chain usually have higher mercury levels.

Unlike some contaminants, such as PCBs and DDT, which collect in the fat and skin of fish, mercury binds to fish muscle. Cutting off the skin and fat and filleting or preparing fish in a special way does not reduce mercury levels in the same way that fat-soluble compounds can be reduced. Varying the types of fish consumed and avoiding fish that are highest in mercury is the best way to reduce exposure. Choosing "light" canned tuna rather than albacore "white" tuna is an easy way to reduce exposure levels.

"Fish is an excellent low-fat food, a great source of protein, vitamins, and minerals," Hayes said. "While we don't want to scare people away from eating all fish, women who are pregnant, or who might one day become pregnant, should choose fish that are low in mercury."

WWW Access Tips

For more information about safe consumption of fish, see the DOH Fish Facts website at http://www.doh.wa.gov/fish/.

Study Funding

This study was funded through the Centers for Disease Control as part of a program to help develop a Washington Environmental Health Tracking Network. The goal of this program is to improve our ability to access and analyze information on environmental contaminants to better understand their impacts on health and guide public health responses to environmental issues.

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